

Revision of the genus *Scopoides* Platnick, 1989 from China, with description of a new genus (Araneae, Gnaphosidae)

Bo Liu¹, Feng Zhang¹

¹ The Key Laboratory of Zoological Systematics and Application, Institute of Life Science and Green Development, College of Life Sciences, Hebei University, Baoding, Hebei 071002, China

Corresponding author: Feng Zhang (dudu06042001@163.com)

Abstract

The genus *Scopoides* Platnick, 1989 from China is revised. A new genus, *Platnickus* **gen. nov.**, is established with the type species *Scopoides xizangensis* Hu, 2001, and a new species is described, *Platnickus reni* **sp. nov.** Three new combinations are proposed: *Allozelotes gyirongensis* (Hu, 2001), **comb. nov.**, *Platnickus wanglangensis* (Yuan, Zhao & Zhang, 2019), **comb. nov.**, and *Platnickus xizangensis* (Hu, 2001), **comb. nov.**

Key words: Ground spider, morphology, new combination, new species, taxonomy

Introduction

Scopoides Platnick, 1989 is a small genus of Gnaphosidae, with 12 named species occurring in the USA and Mexico, and three species in China (WSC 2023). *Scopoides* was first reported from China (Xizang) by Hu (2001), who described two new species, *S. gyirongensis* Hu, 2001 and *S. xizangensis* Hu, 2001. Yuan et al. (2019) reported a third species from China (Sichuan), *S. wanglangensis* Yuan, Zhao & Zhang, 2019. *Scopoides* in North America was revised by Platnick and Shadab (1976), but species from China have never been revised and could be misplaced.

While examining *Scopoides* specimens from southwestern China, we compared them with generotype described in Platnick and Shadab (1976) and found none of them belong to *Scopoides*. The goals of this paper are to revise *Scopoides* in China, including a redescription of the type specimens of *S. gyirongensis* and *S. xizangensis*, propose three new combinations, and describe a new genus and a new species.

Material and method

All specimens preserved in 75% ethanol were examined and measured under a Leica M205A stereomicroscope. The photographs of the genitalia and chelicerae were taken using an Olympus BX51 microscope or a Leica DM6000 B microscope equipped with a Kuy Nice CCD camera and were imported into Helicon Focus v. 7 for stacking. Bodies were photographed using a Leica M205A stereomicroscope. Final figures were retouched in Adobe Photoshop 2020. All measurements are given in millimeters. Leg measurements are shown as:



Academic editor: Sarah Crews

Received: 16 April 2023

Accepted: 27 June 2023

Published: 26 July 2023

ZooBank: <https://zoobank.org/AF90FD70-0E9D-4ABB-9B21-A3A74457E7CC>

Citation: Liu B, Zhang F (2023)
Revision of the genus *Scopoides* Platnick, 1989 from China, with description of a new genus (Araneae, Gnaphosidae). ZooKeys 1172: 203–215. <https://doi.org/10.3897/zookeys.1172.105034>

Copyright: © Bo Liu & Feng Zhang.
This is an open access article distributed under terms of the Creative Commons Attribution License (Attribution 4.0 International – CC BY 4.0).

total length (femur, patella, tibia, metatarsus, tarsus). Vulvae were cleared with Pancreatin (BBI Life Sciences). All specimens studied are deposited in the Museum of Hebei University (MHBV), Baoding, China.

Abbreviations used: **AG**, accessory gland; **AER**, anterior eye row; **AH**, anterior hoods; **ALE**, anterior lateral eyes; **AME**, anterior median eyes; **BG**, Bennett's gland; **BH**, basal hematodocha; **C**, conductor; **CD**, copulatory duct; **CO**, copulatory opening; **d**, dorsal; **E**, embolus; **EB**, embolar base; **ED**, embolar denticle; **EP**, embolar base process; **ET**, epigynal teeth; **FD**, fertilization ducts; **Fe**, femur; **H**, hoods; **MA**, median apophysis; **MaAm**, major ampullate gland spigots; **MP**, mating plug; **Mt**, metatarsus; **p**, prolateral; **Pa**, patella; **PER**, posterior eye row; **PET**, petioles; **Pi**, piriform gland spigots; **PLE**, posterior lateral eyes; **PME**, posterior median eyes; **PO**, pocket; **PS**, primary spermathecae; **r**, retro-lateral; **R**, radix; **SD**, sperm duct; **SE**, septum; **SS**, secondary spermathecae; **ST**, subtegulum; **T**, tegulum; **Ta**, tarsus; **TA**, tibial apophysis; **Ti**, tibia; **v**, ventral.

Taxonomy

Family Gnaphosidae, Banks, 1892

Genus *Allozelotes* Yin & Peng, 1998

Type species. *Allozelotes lushan* Yin & Peng, 1998.

Diagnosis. See Yin and Peng (1998).

Comments. This genus includes only four species from China, two of them (*A. microsaccatus* Yang, Zhang, Zhang & Kim, 2009 and *A. songi* Yang, Zhang, Zhang & Kim, 2009) are known only from females (WSC 2023).

Distribution. China (Hunan, Jiangxi, Yunnan).

Allozelotes gyirongensis (Hu, 2001), comb. nov.

Figs 1, 2

(吉隆异狂蛛)

Scopoides gyirongensis Hu, 2001: 267, fig. 152 (♀).

Scopoides gyirongensis: Song et al. 2004: 206, fig. 122 (♀).

Type material. *Holotype* ♀, CHINA: Xizang Autonomous Region, Gyirong County, 2800 m elev., 17.XII.1983, Y. Yan leg., examined.

Diagnosis. This species resembles *A. microsaccatus* in having a similar epigyne structure, but it can be distinguished by the medially procurved and weakly sclerotized anterior folds (vs anterior folds relatively straight and strongly sclerotized medially) (Fig. 2).

Redescription. Female. Holotype: total length 8.21; carapace 3.30 long, 2.65 wide; abdomen 4.90 long, 3.01 wide. Eye sizes and interdistances: AME 0.20, ALE 0.14, PME 0.15, PLE 0.17, AME–AME 0.05, AME–ALE 0.02, PME–PME 0.13, PME–PLE 0.08, ALE–PLE 0.03; posterior eye row procurved. Leg measurements: I 8.64 (2.66, 1.39, 2.03, 1.45, 1.11), II 7.81 (2.40, 1.45, 1.65, 1.30, 1.01), III 7.30 (2.00, 1.02, 1.78, 1.50, 1.00), IV 10.60 (2.90, 1.31, 2.49, 2.90, 1.00). Leg spination: I: Fe d2 p1, Ti v2, Mt v1; II: Fe d4 p1 r1, Ti v2, Mt v2; III: Fe d2 p2, Pa p1 r1, Ti d1

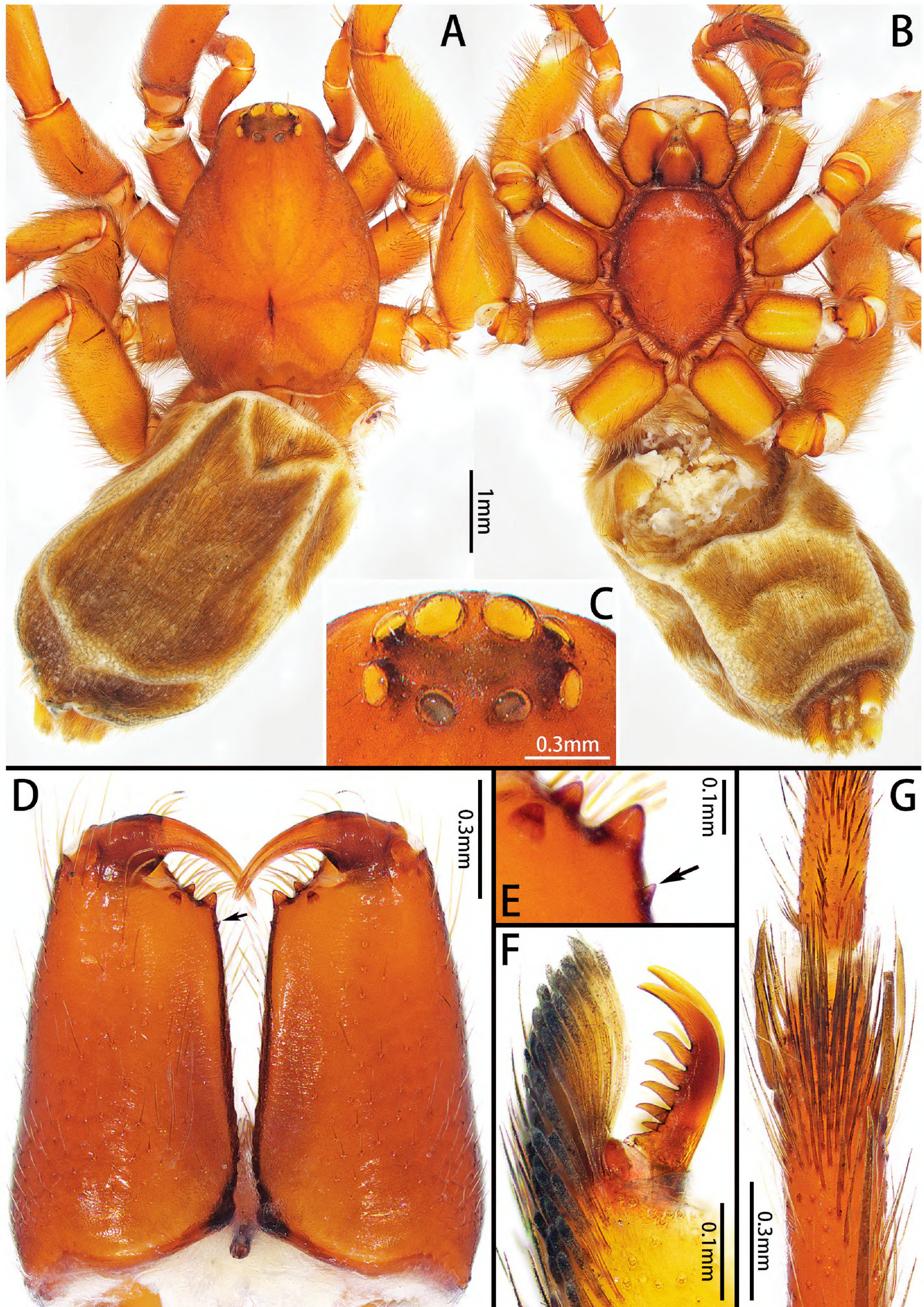


Figure 1. *Allozelotes gyirongensis* comb. nov., female **A, B** habitus, dorsal and ventral view **C** eye region, dorsal view **D** chelicerae, ventral view **E** details of chelicera, ventral view **F** tarsus IV, claw and claw tuft, lateral view **G** metatarsus IV, preening brush, ventral view.

p2 r2 v3, Mt d2 p3 r2 v6; IV: Fe d2 p1, Pa r1, Ti p3 r3 v6, Mt d1 p3 r1 v6. Cheliceral promargin with 3 teeth, retromargin with 1 tooth (Fig. 1D, E). Color in alcohol (Fig. 1A, B): carapace yellow-brown; cephalic groove and radial furrow black; fovea distinct, longitudinal. Legs yellow-brown. Abdomen grey, without markings.

Epigyne (Fig. 2). Epigynal plate diamond-shaped. Atrium almost two times wider than long. Septum wide posteriorly, stem almost two times thinner than base. Anterior folds procurved and weakly sclerotized medially, forming hoods posteriorly. Lateral folds form pockets. Copulatory opening large, located anteriorly. Copulatory ducts long, coiled, sclerotized proximally, and membranous distally. Accessory glands fist-shaped. Primary spermathecae small and globular, located at posterolateral part of septum, separated by their own diameter. Secondary spermathecae oval, almost equal to primary spermathecae in size. Fertilization ducts slender, laterally directed.

Male. Unknown.

Distribution. China (Xizang).

Remarks. The presence of long, snail-shell-shaped, convoluted copulatory ducts, fist-shaped accessory glands, and the secondary spermathecae almost the same size as the primary spermathecae indicate that this species is a member of *Allozelotes*, rather than *Scopoides*.

Yin and Peng (1998) placed *Allozelotes* as a zelotine spider based on the presence of a preening comb on metatarsi III and IV. Azevedo et al. (2017)

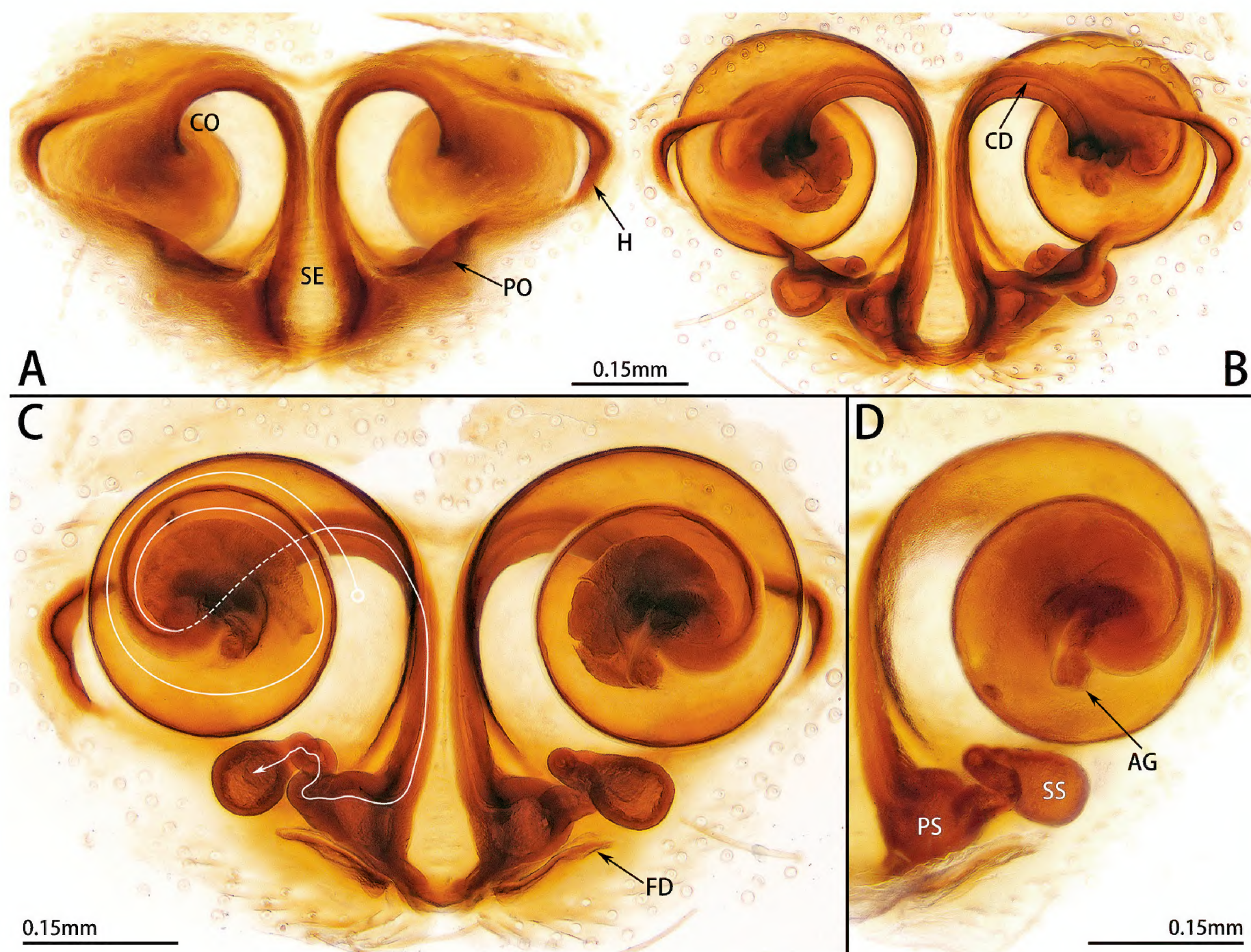


Figure 2. Female genitalia of *Allozelotes gyirongensis* comb. nov. **A, B** ventral view **C, D** dorsal view.

placed this genus in Zelotinae based on Yin and Peng's work. However, while examining the type specimens of *A. gyirongensis* comb. nov., we found a preening brush rather than preening comb on metatarsi III and IV (Fig. 1G) which indicates that *Allozelotes* is not a member of Zelotinae. *Allozelotes* is not assigned to any of the known subfamilies of Gnaphosidae (Azevedo et al. 2017; Lin and Li 2020), and it is unplaced here.

Genus *Platnickus* gen. nov.

<https://zoobank.org/65D2E231-A79F-496E-9F47-743EB0160094>

(普蛛属)

Type species. *Scopoides xizangensis* Hu, 2001.

Etymology. The genus name is in honor of Norman I. Platnick (1951–2020) and his extensive contributions to arachnology; masculine in gender.

Diagnosis. *Platnickus* gen. nov. resembles *Allozelotes* by the presence of a procurved PER, the presence of one retromarginal tooth, and the presence of a preening brush on metatarsi III and IV, but it can be distinguished by: 1) the slightly curved embolus, directed clockwise (vs embolus strongly curved, directed counterclockwise); 2) the absence of a macrosetae on the tibial apophysis; 3) the short copulatory ducts (vs long, convoluted copulatory ducts); and 4) the presence of long ducts leading to the secondary spermathecae and the secondary spermathecae with many glands.

Platnickus gen. nov. differs from *Scopoides* by the: 1) presence of a preening brush on metatarsi III and IV; 2) presence of a radix; 3) medially originating embolus (vs basally originating); 4) absence of ventral and dorsal points on the tibial apophysis; 5) copulatory opening located posteriorly (vs located anteriorly); and 6) presence of long ducts leading to the secondary spermathecae and the secondary spermathecae with many glands.

Description. Medium-sized (total length: males = 5.63–7.61; females = 6.32–7.01). Carapace smooth, elongate-ovoid in dorsal view, highest at eye area, widest at coxae II and III. From above, AER straight; PER procurved; PME oblique, flat (Figs 3D, 5C, 7C). Cheliceral promargin with 2 or 3 teeth, retromargin with 1 tooth (Figs 3I, 5E, 7D). Leg spination: I: Fe d2/3 p1/2 r0/1, Ti v2/4, Mt v0/2; II: Fe d2/3 p1/2 r0/1, Ti v3/4, Mt v1/2; III: Fe d2/3 p1/2 r2, Pa p0/1 r1, Ti p3/5 r3/4 v4/5, Mt d1/2 p3 r2/3 v4/6; IV: Fe d2/3 p0/2 r2/3, Pa r1, Ti p3/5 r3/5 v5/6, Mt d1 p3 r3 v5/6. Leg formula: 4123. Female palp with claw (Fig. 5D). Trochanters not notched. Metatarsi III and IV with preening brush (Fig. 3E). Claw on tarsi IV with 8 teeth and claw tuft well developed (Fig. 3F). Anterior lateral spinnerets slightly longer than others, with 5 or 6 enlarged piriform gland spigots (Fig. 3G, H). Color in alcohol (Figs 3A, B, 5A, B, 7A, B): carapace pale or yellow-brown; cephalic groove and radial furrow black; fovea distinct, longitudinal. Legs pale or yellow-brown. Abdomen light grey, with anterior dorsal scutum and 3 pairs of muscle impressions medially.

Male palp (Figs 4, 8): femur and patella unmodified. Cymbium pear-shaped, without claw. Basal hematodocha large, well developed. Tibial apophysis pointed, almost length of tibia, located dorsally. Tegulum larger than subtegulum. Conductor ribbon-shaped. Distal tubular membrane present. Median apophysis irregular polygon shaped. Radix elongate. Embolus originates at about 8–9 o'clock, with several ridges, bifurcated or notched distally.

Epigyne. See below (description in *P. xizangensis*).

Remarks. Currently *Platnickus* gen. nov. is not assigned to any of the known subfamilies of Gnaphosidae (Azevedo et al. 2017; Lin and Li 2020); it is unplaced.

Distribution. China (Xizang, Sichuan).

Composition. *Platnickus xizangensis* (Hu, 2001), *P. reni* sp. nov., *P. wanglangensis* (Yuan, Zhao & Zhang, 2019).

***Platnickus xizangensis* (Hu, 2001), comb. nov.**

Figs 3–6

(西藏普蛛)

Scopoides xizangensis Hu, 2001: 268, fig. 153 (♀♂).

Scopoides xizangensis: Song et al. 2004: 207, fig. 123 (♀♂).

Type material. Holotype: ♀, CHINA: Xizang Autonomous Region, Linzhi City, 3000 m elev., 10.VIII.1987, F. Zhang leg. **Paratype:** 3♀ 2♂, same data as holotype, examined.

Other material examined. 1♂, CHINA: Xizang Autonomous Region, Bome County, 14.VIII.2002, M. Zhu & F. Zhang leg.

Diagnosis. Males resemble *P. wanglangensis* in having a similar palp, but they can be distinguished by the presence of a curved embolus (vs embolus relatively straight) and the relatively flat median apophysis (vs median apophysis somewhat twisted) (Fig. 4).

Redescription. Male. Total length 5.63–6.79. One paratype: total length 6.16; carapace 2.58 long, 2.08 wide; abdomen 3.57 long, 2.35 wide. Eye sizes and interdistances: AME 0.18, ALE 0.16, PME 0.13, PLE 0.18, AME–AME 0.05, AME–ALE 0.02, PME–PME 0.10, PME–PLE 0.05, ALE–PLE 0.04. Leg measurements: I 6.52 (1.93, 1.02, 1.55, 1.12, 0.90), II 6.26 (1.80, 0.97, 1.52, 1.09, 0.88), III 5.57 (1.58, 0.76, 1.23, 1.19, 0.81), IV 7.61 (2.07, 1.06, 1.75, 1.79, 0.94). Leg spination: I: Fe d3 p2 r1, Ti v4, Mt v2; II: Fe d3 p2 r1, Ti v4, Mt v2; III: Fe d3 p2 r2, Pa p1 r1, Ti p5 r4 v5, Mt d2 p3 r2 v6; IV: Fe d3 p2 r2, Pa r1, Ti p5 r5 v6, Mt d1 p3 r3 v6. Cheliceral promargin with 2 teeth. Color in alcohol (Fig. 3A, B): carapace and legs light brown.

Palp (Fig. 4). Conductor ribbon-shaped. Median apophysis relatively flat and long, almost 1/2 length of bulb. Embolus broad, width/length ratio nearly 1/2, enwrapped by elongated radix. Embolus tip bifurcated, with many embolar denticles posteriorly.

Female. Total length 6.32–7.01. Holotype: total length 6.75; carapace 2.89 long, 2.21 wide; abdomen 3.81 long, 2.58 wide. Eye sizes and interdistances: AME 0.19, ALE 0.17, PME 0.16, PLE 0.18, AME–AME 0.04, AME–ALE 0.02, PME–PME 0.10, PME–PLE 0.07, ALE–PLE 0.02. Leg measurements: I 6.03 (1.78, 0.90, 1.51, 1.03, 0.81), II 5.57 (1.69, 0.91, 1.37, 0.84, 0.76), III 5.19 (1.50, 0.75, 1.06, 1.15, 0.73), IV 7.38 (2.01, 1.00, 1.74, 1.75, 0.88). Leg spination: I: Fe d3 p2, Ti v3, Mt v2; II: Fe d3 p2 r1, Ti v3, Mt v2; III: Fe d3 p2 r2, Pa p1 r1, Ti p4 r4 v5, Mt d2 p3 r2 v6; IV: Fe d3 p2 r2, Pa r1, Ti p4 r5 v6, Mt d1 p3 r3 v6. Chelicerae (Fig. 5E) as in male. Color in alcohol (Fig. 5A, B) as in male.

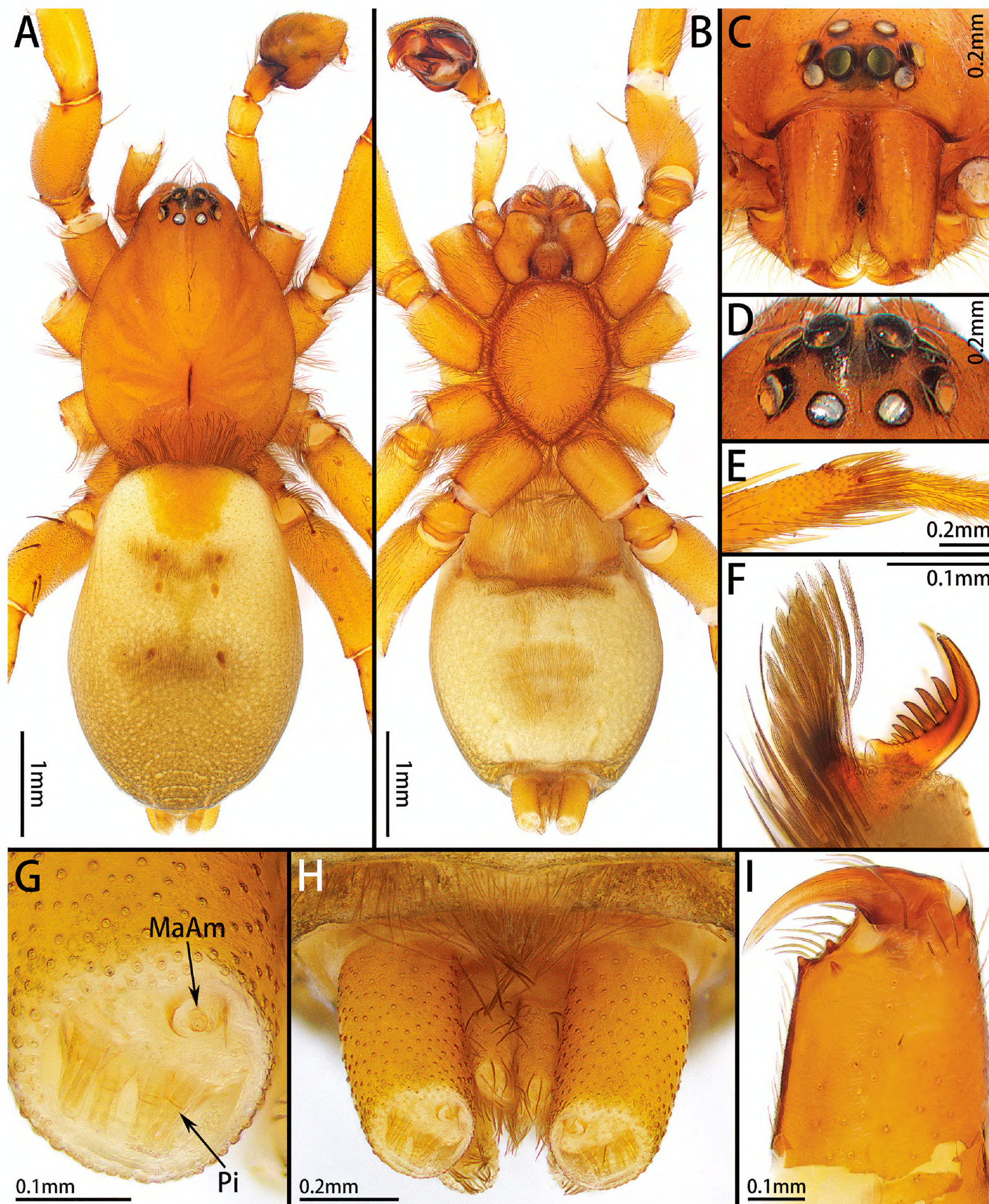


Figure 3. *Platnickus xizangensis* comb. nov., male **A–C** habitus, dorsal, ventral, and frontal view **D** eye region, dorsal view **E** metatarsus IV, preening brush, ventral view **F** tarsus IV, claw and claw tuft, lateral view **G** spigots on anterior lateral spinneret **H** spinnerets, ventral view **I** chelicerae, ventral view.

Epigyne (Fig. 6). Epigynal plate irregularly hexagon-shaped, width/length ratio almost 7/5, with large atrium. Anterior folds M-shaped, forming hoods posteriorly. Lateral folds form pockets antero-laterally. Septum wide posteriorly,

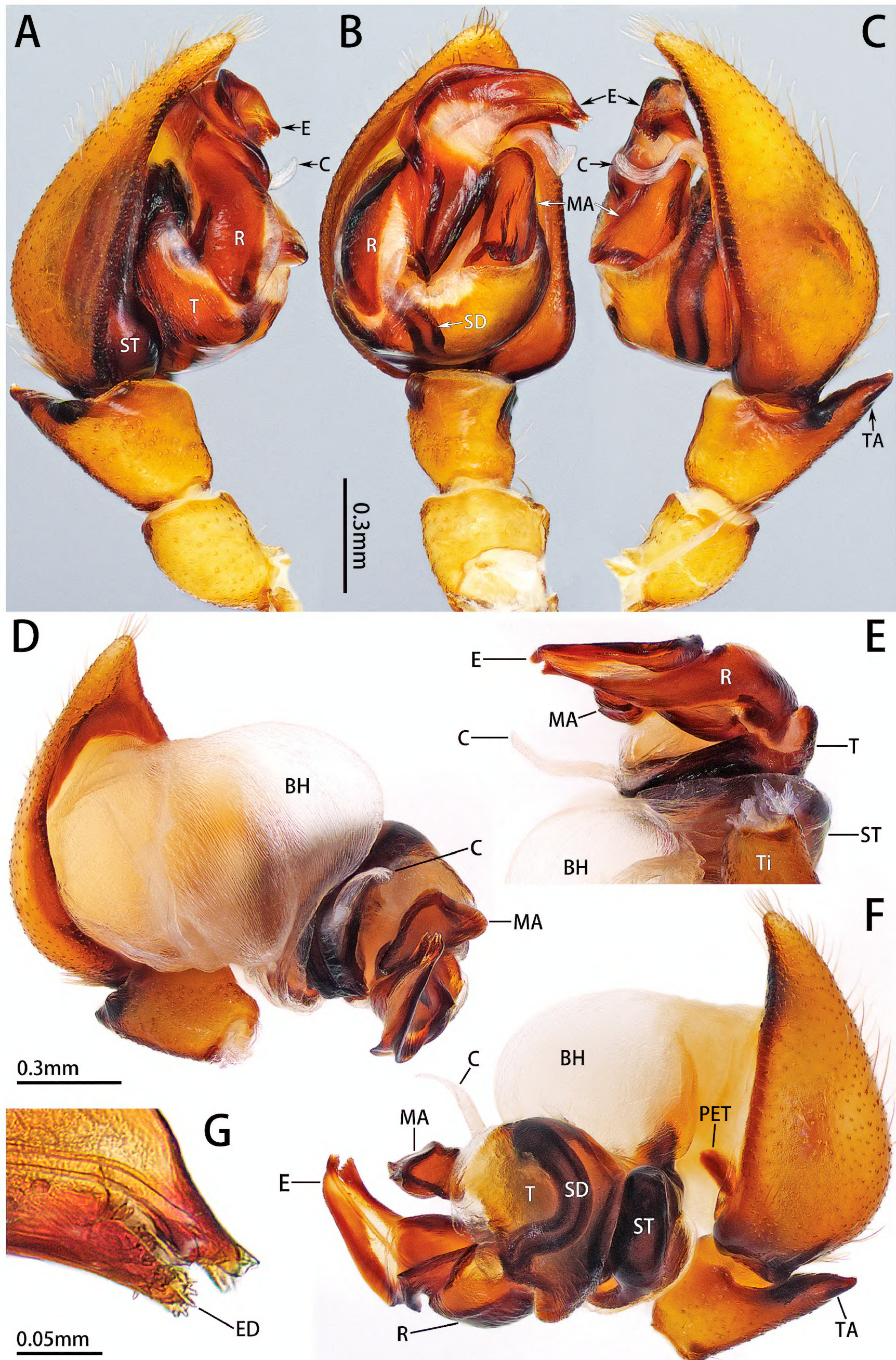


Figure 4. Palp of *Platnickus xizangensis* comb. nov., male **A, B** prolateral, ventral and retrolateral view **D–F** expanded palp, prolateral, posterior and retrolateral view **G** embolus tip.

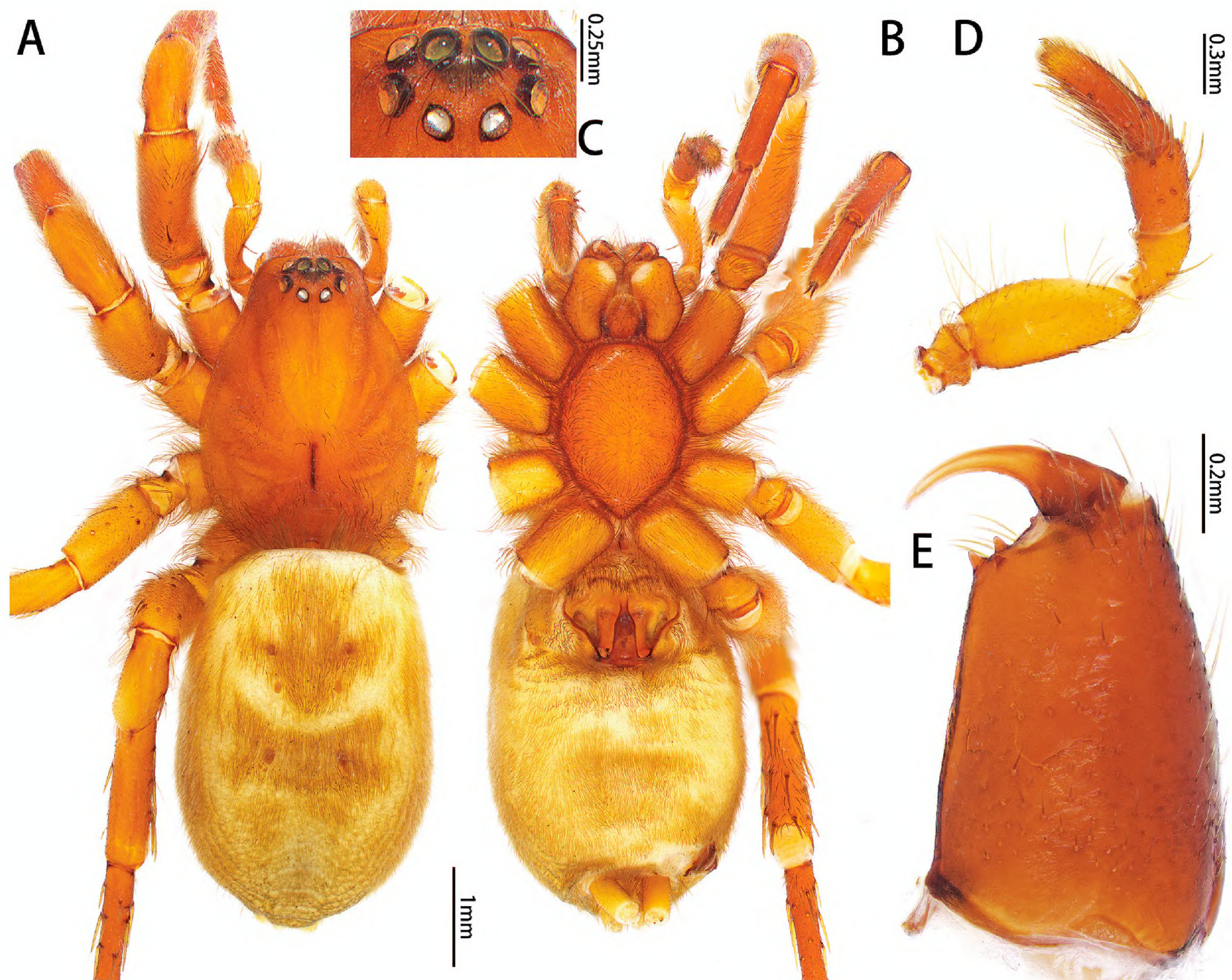


Figure 5. *Platnickus xizangensis* comb. nov., female **A**, **B** habitus, dorsal and ventral view **C** eye region, dorsal view **D** left palp, retrolateral view **E** chelicera, ventral view.

stem almost 3 times thinner than base. Copulatory opening large, distinct, located posteriorly. Copulatory ducts well sclerotized and short. Primary spermathecae large, peanut-shell-shaped. Secondary spermathecae with long ducts and many glands. Bennett's gland long, oval, with constriction medially. Fertilization ducts laterally directed.

Distribution. China (Xizang).

***Platnickus reni* sp. nov.**

<https://zoobank.org/80C1C20A-464C-4116-BC49-89689FDFEFEF>

Figs 7, 8

(任氏普蛛)

Type material. Holotype: ♂, CHINA: Sichuan Prov., Barkam City, Mount Zhangqia, 3100 m elev., 27.VII.1999, G. Ren leg.

Etymology. The species is named after the collector Prof. Guodong Ren (Hebei University, Baoding, China).

Diagnosis. The male resembles *P. xizangensis* in having a similar palp, but it can be distinguished by the presence of embolar base process (EP1

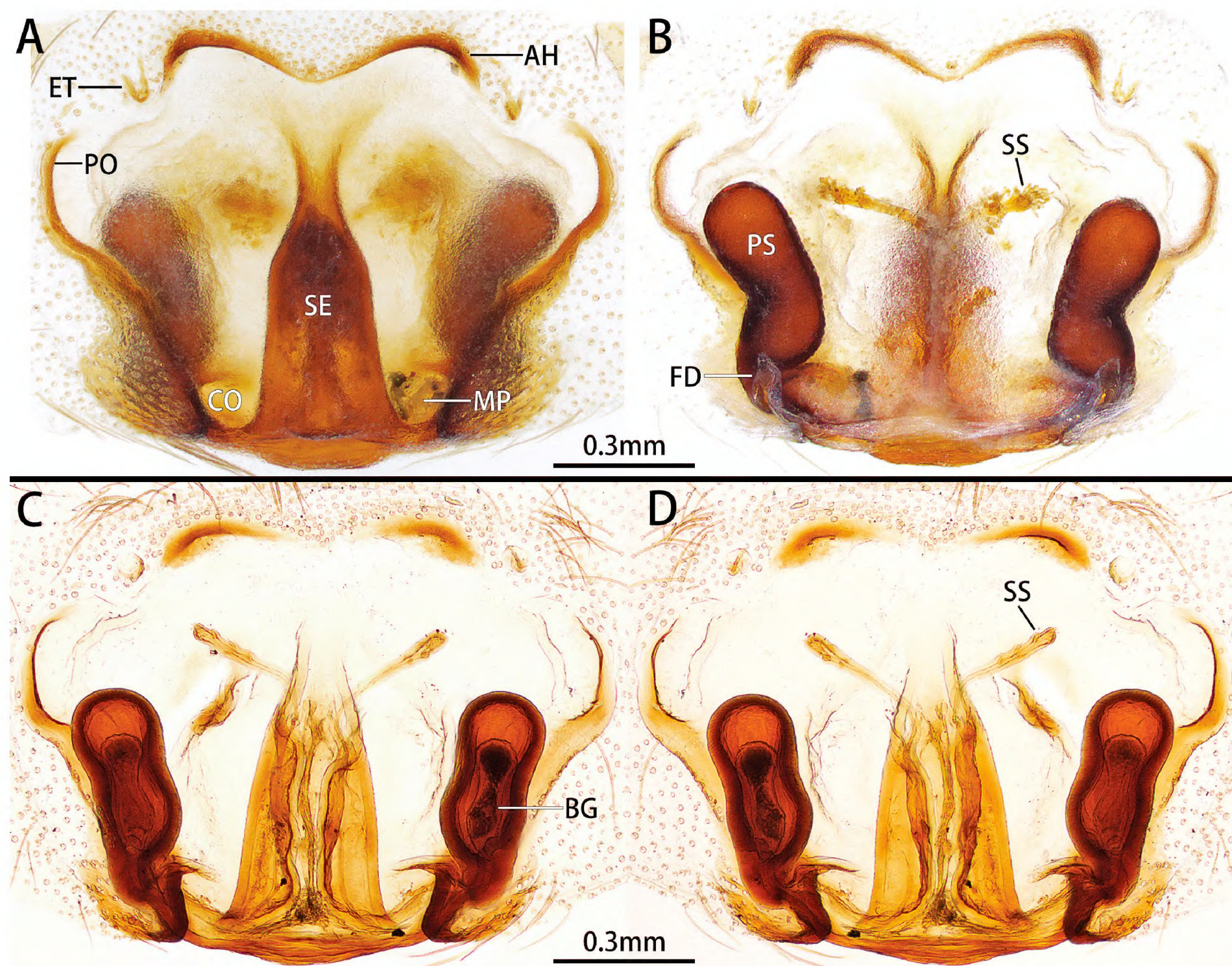


Figure 6. Female genitalia of *Platnickus xizangensis* comb. nov. **A, C** ventral view **B, D** dorsal view.

and EP2), the notched embolus tip (vs bifid), the spoon-shaped conductor in retrolateral view (vs ribbon shaped), and the relatively short median apophysis, almost 1/3 length of bulb (vs relatively long, almost 1/2 length of bulb) (Figs 4, 8).

Description. Male. total length 5.71; carapace 3.38 long, 2.33 wide; abdomen 4.13 long, 2.27 wide. Eye sizes and interdistances: AME 0.18, ALE 0.17, PME 0.14, PLE 0.19, AME–AME 0.08, AME–ALE 0.03, PME–PME 0.10, PME–PLE 0.08, ALE–PLE 0.05. Leg measurements: I 8.86 (2.57, 1.33, 2.17, 1.59, 1.20), II 8.15 (2.37, 1.28, 1.94, 1.47, 1.09), III 7.39 (2.11, 1.05, 1.62, 1.60, 1.01), IV 10.62 (2.89, 1.39, 2.34, 2.90, 1.10). Leg spination: I: Fe d2 p1, Ti v2; II: Fe d2 p1, Ti v3, Mt v1; III: Fe d2 p1 r2, Pa r1, Ti p3 r3 v4, Mt d1 p3 r3 v4; IV: Fe d2 r3, Pa r1, Ti p3 r3 v6, Mt d1 p3 r3 v6. Cheliceral promargin with 3 teeth (Fig. 7D). Color in alcohol (Fig. 7A, B): carapace and legs yellow-brown.

Palp (Fig. 8). Conductor spoon-shaped in retrolateral view. Median apophysis relatively short, almost 1/3 length of bulb. Subtegulum slender anteriorly. Embolus twisted distally, with several ridges that form processes (EP1 and EP2). Embolus tip notched.

Female. Unknown.

Distribution. China (Sichuan).

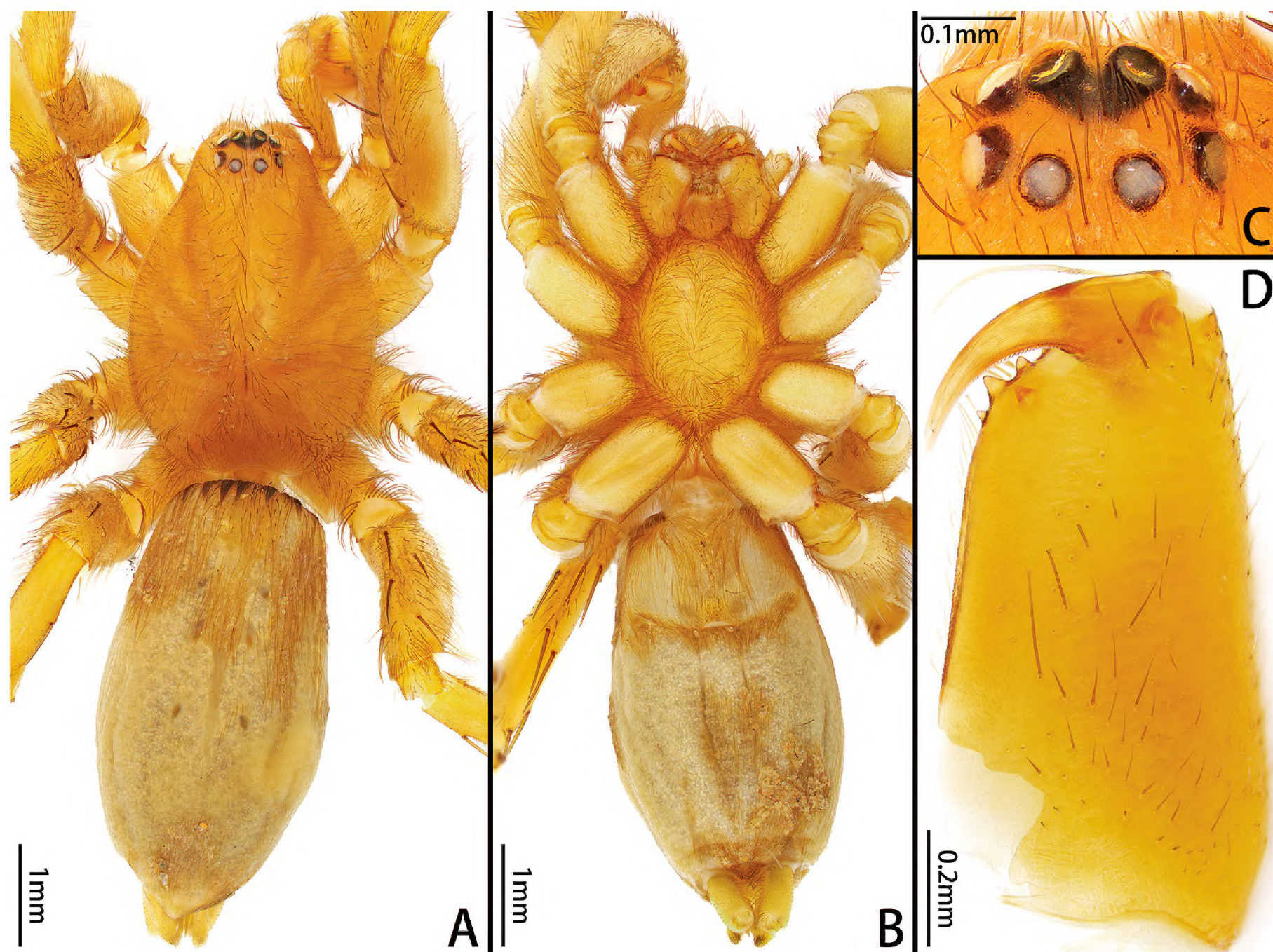


Figure 7. *Platnickus reni* sp. nov., male **A**, **B** habitus, dorsal and ventral view **C** eye region, dorsal view **D** chelicera, ventral view.

***Platnickus wanglangensis* (Yuan, Zhao & Zhang, 2019), comb. nov.**

(王朗普蛛)

Scopoides wanglangensis Yuan, Zhao & Zhang, 2019: 22, fig. 16 (♂).

Type material. Holotype: ♂, CHINA: Sichuan Province, Pingwu County, Wanglang Nature Reserve, Zhugenchu, Baisha Valley, 32°52.729'N, 104°02.779'E, 2948 m elev., 15.V.2018, Z, Zhang et al. leg., not examined.

Diagnosis. Males resemble *P. xizangensis* in having a similar palp, but they can be distinguished by the presence of a relatively straight embolus (vs relatively curved embolus) and the relatively twisted median apophysis (vs median apophysis relatively flat) (Fig. 4).

Description. Male. See Yuan et al. (2019).

Remarks. The illustrations and descriptions by Yuan et al. (2019: 22, fig. 16) show the same characteristics as in *Platnickus* gen. nov. For example, 1) the procurved posterior eye row; 2) the presence of three promarginal teeth and one retromarginal cheliceral tooth; 3) the presence of a radix; 4) the medially originating embolus with several ridges; 5) the irregular polygon-shaped median apophysis; and 6) the dorsally located tibial apophysis. These characters indicate that this species should be placed in *Platnickus* gen. nov.

Distribution. China (Sichuan).

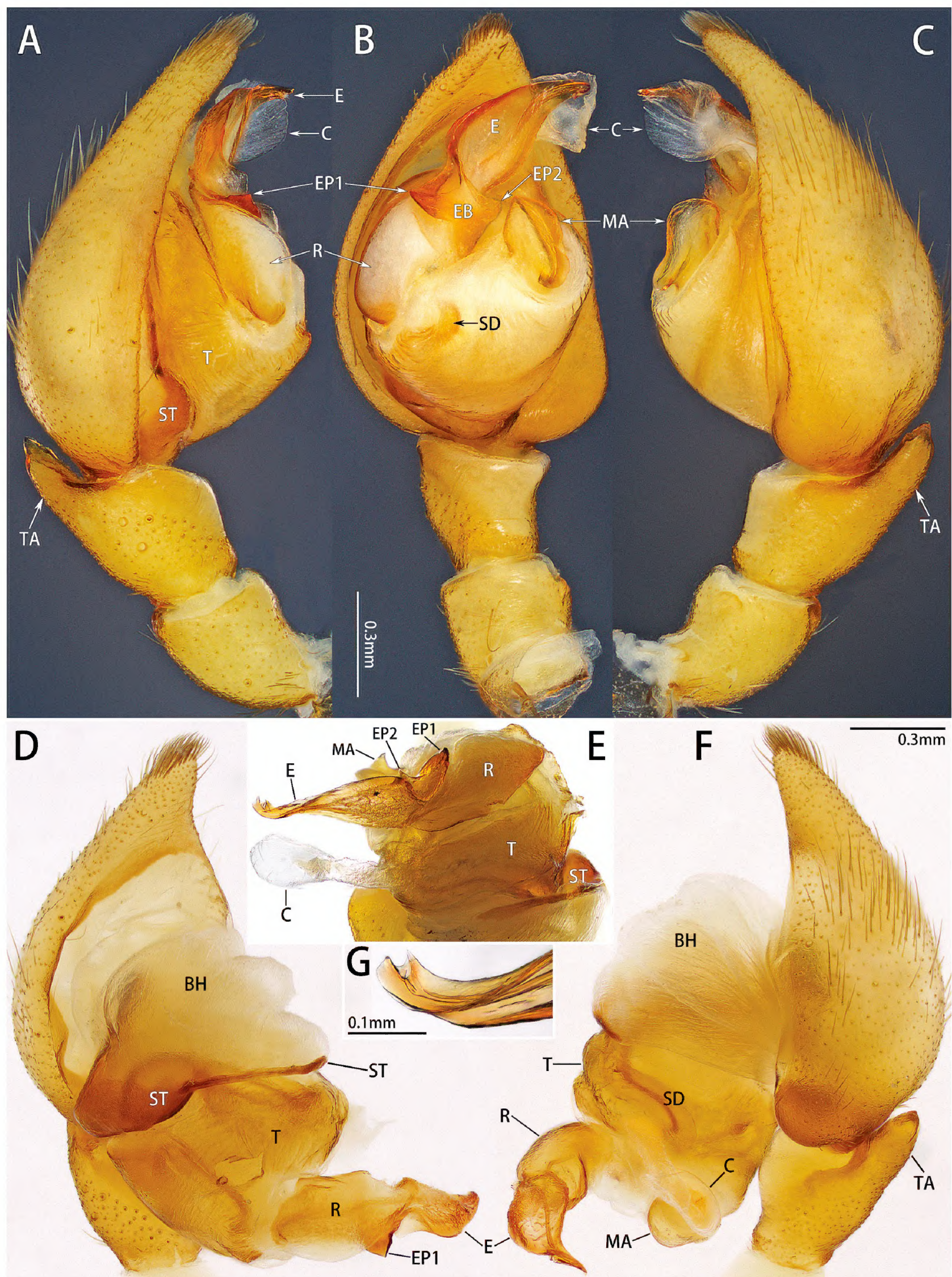


Figure 8. Palp of *Platnickus reni* sp. nov., male **A, B** prolateral, ventral and retrolateral view **D–F** expanded palp (BH is broken), prolateral, anterior and retrolateral view **G** embolus tip.

Acknowledgements

We are grateful to Yuri Marusik (Institute for Biological Problems of the North RAS, Magadan, Russia) for valuable comments on the manuscript, Sarah Crews (California Academy of Sciences, San Francisco, USA) for her editorial efforts. English of the earlier draft was checked by Dr Xinping Wang.

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Funding

This study was supported by the National Natural Science Foundation of China (no. 32170468), and by the Science and Technology Fundamental Resources Investigation Program (grant no. 2022FY202100).

Author contributions

BL and FZ performed morphological species identification. BL finished the species descriptions. BL and FZ drafted and revised the manuscript. All authors read and approved the final version of the manuscript.

Author ORCIDs

Bo Liu  <https://orcid.org/0000-0003-3740-7173>

Feng Zhang  <https://orcid.org/0000-0002-3347-1031>

Data availability

All of the data that support the findings of this study are available in the main text.

References

- Azevedo GHF, Griswold CE, Santos AJ (2017) Systematics and evolution of ground spiders revisited (Araneae, Dionycha, Gnaphosidae). *Cladistics* 34(6): 579–626. <https://doi.org/10.1111/cla.12226>
- Hu JL (2001) Spiders in Qinghai–Tibet Plateau of China. Henan Science and Technology Publishing House, Henan, 229–230.
- Lin YJ, Li SQ (2020) Description on *Solitudes dushengi* gen. nov et sp. nov. from Xinjiang, China (Araneae: Gnaphosidae). *Zoological Systematics* 45: 312–315. <https://doi.org/10.11865/zs.202036>
- Platnick NI, Shadab MU (1976) A revision of the spider genera *Rachodrassus*, *Sosticus*, and *Scopodes* (Araneae, Gnaphosidae) in North America. *American Museum Novitates* 2594: 1–33. <http://hdl.handle.net/2246/2977>
- Song DX, Zhu MS, Zhang F (2004) Fauna Sinica: Invertebrata (Vol. 39): Arachnida: Araneae: Gnaphosidae. Science Press, Beijing, 243–246.
- World Spider Catalog (2023) World Spider Catalog. Version 24. Natural History Museum Bern. <https://doi.org/10.24436/2>
- Yin CM, Peng XJ (1998) Two new genera of the family Gnaphosidae (Arachnida: Araneae) from China. *Life Science Research* 2: 258–267.
- Yuan L, Zhao LJ, Zhang ZS (2019) Preliminary study on the spider diversity of the Wanglang National Nature Reserve. *Acta Arachnologica Sinica* 28(1): 7–36. <https://doi.org/10.3969/j.issn.1005-9628.2019.01.002>